Oligochæta are related to the marine Polychæta, and in the position of forms to be derived from them, it may be possible to compare this cæcum with the siphon of the Capitellidæ.

(3) As to the *Reproductive Organs*, I have but little to add to Benham's account. As he has observed, the anterior pair of spermathecæ are the smaller; but I also found that corresponding to this the posterior pair of spermiducal glands were smaller than the anterior pair of those glands. I could find no diverticulum to either pair of spermathecæ, and no penial setæ connected with the male pores.

## 4. List of Mammals obtained by Mr. H. J. Mackinder during his recent Expedition to Mount Kenya, British East Africa. By Oldfield Thomas.

[Received February 15, 1900.]

The Mammal-fauna of Mount Kenya, the highest mountain in British East Africa, has hitherto been practically unknown, for although Dr. Gregory collected a few specimens during his ascent in 1893, these have not hitherto been satisfactorily determined. It has therefore been with great interest that I have worked out the excellent collection obtained on the mountain during Mr. H. J. Mackinder's recent successful expedition there, an expedition of which he has himself given an account before the Geographical Society[1].

The actual collecting was done by Mr. Mackinder's two assistants, Messrs. Ernest Saunders and C. Camburn, and much credit is due to them for the way in which they have succeeded in making so admirable a collection under somewhat difficult circumstances. In addition, some of the larger animals, including the Mountain Dassies, were shot by Mr. Mackinder's colleague, Mr. C. B. Hausburg, and his Alpine guide, Cesar Ollier.

The species of mammals obtained on Mount Kenya itself are fourteen in number; and I have also added a list of those collected at Nairobi, on the Uganda Railway, where the party remained some little time. The whole series of skins has been acquired by the British Museum.

Of the special Mountain-mammals the most interesting is a new Dassy, of a rock- and not forest-inhabiting group, which appears to be isolated above the forest zone at 12,000–15,000 feet. A second new Dassy, of the forest group, comes from 8000 feet.

With the help of the fine collection of East African mammals presented to the National Museum by Mr. F. J. Jackson, and worked out by Mr. W. E. de Winton, the determination of the present series has presented few difficulties, and I must record my

[1] See Geogr. Journ. xv. p. 453 (1900).

indebtedness to Mr. de Winton for the assistance his determinations of the more obscure forms have been to me in the preparation of the present paper.

1. Colobus caudatus Thos.

*a–c*. ♂ ♀. Western slope of Mt. Kenya, 8000–10,000 ft., 8 & 9/99.

There appears to be no difference between these specimens and examples from Kilima-njaro.

Dr. Matschie has also recorded this Monkey from Mt. Kenya [1].

2. Crocidura, sp.

*a–d*. ♂ ♀. Western slope of Mt. Kenya, 8000–10,000 ft., 8–9/99.

A medium-sized species with a short tail.

3. Sciurus rufobrachiatus Waterh.

*a*. Western slope of Mt. Kenya, 8000 ft., 14/9/99.

This specimen differs in various details from ordinary examples of *S. rufobrachiatus*, but most of its peculiarities occur in one or other of the large series in the Museum.

4. Funisciurus jacksoni de Wint.

*a*. ♂. Western slope of Mt. Kenya, 8000 ft., 16/9/99.

5. Graphiurus murinus Desm.

*a*. ♂. Western slope of Mt. Kenya, 11,000 ft., 22/8/99.

The determination of this Dormouse is somewhat doubtful, for, as so often happens in this group, the skin has been severely singed, and the colour consequently more or less altered.

6. Mus jacksoni de Wint.

*a*. ♂. Forest zone of Mt. Kenya, 8000 ft.

7. Mus (Leggada) minutoides Smith.

*a*. ♀. Foot of Mt. Kenya, 7000 ft., 17/8/99.

8. Lophuromys aquilus True.

*a–d*. Western slope of Mt. Kenya, 8000–10,000 ft.

These specimens closely agree with examples captured by Mr. Jackson at Ravine Station, with the exception that their tails average slightly shorter. The colour of their feet varies a good deal, one having nearly white feet, while in the others they are brown or black.

"Trapped among bamboo or bushy undergrowth."

"In Forest zone."

[1] SB. Ges. nat. Fr. Berl. 1899, p. 138.

9. Otomys irroratus Bts.

*a*. Western slope of Mt. Kenya, 8000 ft., 16 Sept. 1899. Forest zone.

*b–g*. Western slope of Mt. Kenya, 10,000 ft. Bamboo zone.

These specimens, though as usual differing among themselves in colour, are very uniform in skull-characters and size. Their dimensions, as taken in the flesh, run as follows :—Head and body 176–195 mm. ; tail 75–91 ; hind-foot 28·5–31. Like Mr. Jackson's and other East African examples of the species, they all have seven laminæ to the last upper molar.

10. Otomys irroratus orestes, subsp. n.

*a*. ♂. Teleki Valley, Mt. Kenya, 13,000 ft., Sept. 3, 1899. *Type*.

[*b*. ♀ in spirit. Höhnel Valley, Upper Alpine zone, Mt. Kenya, 1893 (Dr. J. W. Gregory).

*c*, *d*. Imperfect skeleton and separate skull. Do. do.]

Size rather smaller, feet slightly and tail decidedly shorter than in the plains form. Colour, of the single skin, corresponding to the greyish and least rufous of the ordinary specimens, rather more mottled than they usually are.

Skull, as compared with the series from 8000–10,000 feet, smaller throughout, with a shorter muzzle and much shorter, though equally broad brain-case. When viewed laterally, it appears more bowed above and higher mesially. Anterior expansion of nasals not exaggerated. Interparietal smaller, not bowed forwards mesially, its antero-posterior diameter less than the length of the coronal suture instead of greater. Molars rather narrower. Laminæ of $m.^3$ only six in number.

Dimensions of the type, measured by collector in the flesh :—Head and body 175 mm. ; tail 62 ; hind foot 27 ; ear 20·5.

Skull : greatest length 39 ; basilar length 31·3 ; greatest breadth 20 ; nasals 17·4 × 7 ; interorbital breadth 4·6 ; interparietal 4·7 × 9 ; palate length from hensilion 16·7 ; diastema 8·8 ; palatine foramina 7·4 ; upper molar series (crowns only) 7·3.

This is evidently a mountain race of the common East African *Otomys*, and it was quite to be expected that in the colder climate of what Dr. Gregory calls the " Upper Alpine zone " of Kenya the feet and tail should be shortened, in accordance with the usual rule in such cases. It is, however, curious that, as exemplified by four examples, the Alpine form should have a lamina less in the last molar. *Otomys jacksoni* Thos., the Mount Elgon representative of the genus, agrees with the lowland form in this respect.

The spirit-specimen obtained by Dr. Gregory in Höhnel Valley measures :—Head and body 141 mm. ; tail 63 ; hind foot 24 (26·5 cum ungue) ; ear 21. Its mammæ number 0—2=4.

*Type*. B. M. No. 0.2.1.21.

Although Dr. Gregory was the first discoverer of this form, his specimens could not be distinguished before owing to the fact that

in all the skull was broken; but they now contribute most valuable confirmatory evidence as to the external proportions and the lamina formulæ of the molars, agreeing in these respects entirely with the perfect skin and skull brought home by Mr. Mackinder.

11. Dendromys mesomelas Brants.

*a*. ♀. Foot of Mt. Kenya, 7000 ft., 15/8/99.

There is in this specimen a very faint trace of the dark frontal band which induced Mr. True to give to the Kilima-njaro Tree-mouse the name of *D. nigrifrons*.

12. Procavia [1] mackinderi, sp. n.

*a–g*. 4 ♂ 3 ♀. Teleki Valley, 13,000 ft., Sept. 1–3, 1899.

Size large. Fur very long and thick, hairs of back over 40 mm. in length; underfur long and abundant. General colour pale grizzled olivaceous grey, the longer hairs dark, with a pale yellowish subterminal band and a black tip; underfur except on the posterior back blackish basally, whitish or buffy terminally, this colour showing on the surface and lightening the general colour of the animal; on the posterior back the underfur is dark from base to tip. Dorsal patch dull yellowish white throughout, very inconspicuous, not visible without parting the long hairs of the back. Head darker, the muzzle coarsely grizzled black and white;

[1] An allied species, of which we have lately obtained specimens, may be described as follows:—

Procavia jacksoni, sp. n.

Size medium. Fur short, coarse and harsh, the hairs of the ordinary fur of the back barely attaining 30 mm. in length; underfur comparatively scanty. General colour coarsely grizzled yellowish brown, the long hairs brown with a yellow subterminal band or black tip; underfur on the anterior back brown basally, yellowish terminally, on the posterior blackish brown throughout. Cheeks grizzled yellowish; forehead rufous brown. Back of ears partly yellow, partly brown; sides of neck yellowish, a few of the longer hairs black-tipped. Dorsal spot conspicuous, dull straw-yellow, the hairs yellow to their bases. Under surface buffy yellow, not sharply defined laterally. Inner sides of limbs yellowish, outer sides like body. Upper surface of hands and feet grizzled brown and whitish.

Skull with the essential characters of that of the *P. abyssinica* group, but, at least in the female, unusually long and narrow, the nasal and frontal regions particularly narrow. Temporal fossæ ending about 4–5 mm. from the back of the skull. Interparietal sutures open. Diastema about 11 mm. in length. Teeth large and hypsodont.

Dimensions of the type, a female, measured in skin:—Head and body 490 mm.; hind foot 67.

Skull (stage vii.): basal length 83; greatest breadth 49·5; nasals 26 × 19; intertemporal breadth 25; length of upper tooth-series (p.$^1$ to m.$^3$) 38; greatest breadth of m.$^1$ 6·9; height of crown of m.$^3$ 7·2; length of anterior lower premolar 2·9.

*Hab.* Ravine Station, British East Africa.

*Type*. Female. B. M. No. 99.8.4.100. Collected and presented by F. J. Jackson, Esq.

This species differs, in its harsher fur, different general colour, and more prominent dorsal spot and narrow skull, from the only previously described species with which it could be confounded, the Abyssinian *P. abyssinica* H. & E.

forehead deep rufous brown; area round eyes blackish. Ears of medium size, the hairs of their backs dark brown, those on the edges and inner surface buffy yellow; a blackish patch on the sides of the neck just below the ears, owing to the black ends to the hairs at this point. Under surface buffy yellow; on the chin and throat the hairs are only tipped with this colour, but on the chest and belly they are buffy to their bases. Upper surface of hands and feet grizzled yellowish brown; inner sides of limbs like belly.

Skull stout and heavy, with a broad flat shield-like frontal region. On the whole it is closely similar to that of *P. abyssinica*[1], though averaging a little larger. Interparietal sutures persistent. Temporal fossæ extending to the hinder end of the skull. Diastema 10 to 12 mm. in length. Molars hypsodont, as usual in this section of the genus.

Dimensions of the type, an adult male, measured in skin and therefore only approximate:—Head and body 565 mm.; hind foot 70.

Skull (stage viii.): basal length 94; greatest breadth 58·5; nasals 30 × 25; intertemporal breadth 27·5; length of upper tooth-series ($p.^1$ to $m.^3$) 41; greatest breadth of $m.^1$ 7·7; height of crown of $m.^3$ (in another, younger specimen) 7·9; length of $p._1$ (of another specimen) 3·2.

*Type.* Male. B.M. No. 0.2.1.35. Collected Sept. 3, 1899.

This fine Dassy is clearly a mountain representative of the *P. jacksoni* of Kikuyu, from which it differs by its larger size, longer form, more abundant underfur, paler colour, and the greater distinctness of the post-auricular black spot.

During his famous East African expedition of 1893, Dr. J. W. Gregory picked up in Höhnel Valley, 12,000 ft., a bleached skull of this species, but without the skin it was impossible to determine it. It was, however, provisionally referred to the Abyssinian *P. shoana*, a species of the black-backed section—a fact which shows how closely these species, so readily distinguishable externally, resemble each other in their cranial characters.

In the good series of skulls obtained by Mr. Mackinder, four males and three females (to which may be added the male skull brought home by Dr. Gregory), there is a decided difference between the sexes in the size of the skull, all the male skulls being longer, broader, and more heavily built than the female ones. The basal lengths are as follows:—♂ 94 mm., 92·5, 90·5, 90, 87: ♀, 84, 81·5, 74 (young).

The members of this group being essentially Rock-Dassies, not occurring in forest country, it is probable that the Kenya species will prove to be isolated by the zone of forest which surrounds the mountains at about 8000–10,000 ft. Besides Mr. Jackson's specimens from Ravine Station, no member of the group has been found in any other part of East Africa, nor are they known further to the south.

[1] *Cf.* Monograph, P. Z. S. 1892, p. 64.

13. Procavia (Dendrohyrax) crawshayi, sp. n.

*a*. ♂. Western slope of Mt. Kenya, 10,000 ft., 7 Sept., 1899. *Type*.

[*b*. ♀. Roromo, Kikuyu Forest, 7800 ft., 29 Nov., 1899. Collected and presented by Richard Crawshay, Esq.]

Size and more essential characters very much as in *P. valida* True. Fur soft, close, and thick, the majority of the fine hairs about 30 mm. in length, though the scattered black ones are longer. General colour marbled greyish brown with a slight rufous or isabelline hue. Dorsal hairs slaty grey basally, gradually darkening to black at about three-fourths their length, then into a yellowish or isabelline subterminal band and a fine blackish point; the scattered longer hairs black from base to tip. Head coarsely grizzled grey, the grizzlings black and white, and therefore forming a true grey, very different to the dorsal colour. Hairs below base of ears dull whitish. Dorsal spot narrow, elongate, shining yellowish white; the hairs, which are 40–45 mm. in length, yellowish white to their bases. Under surface along middle line, from interramia backwards, fulvous or deep buffy, similar to but rather paler than the colour in *P. valida*; but the chin and sides of neck are grey, not buffy, and the sides of the chest, the groins, and the inner sides of the limbs are whitish. Outer sides of limbs and upper surfaces of hands and feet like sides of body, not becoming black terminally.

Skull very similar to that of *P. valida* and the other allied species.

Dimensions of the type, measured in skin:—Head and body 460 mm.; hind foot 59.

Skull (stage v.): basal length 79; greatest breadth 49·5.

Skull of Mr. Crawshay's specimen (stage viii.): basal length 85; greatest breadth 50; nasals 25 × 18; intertemporal breadth 26; diastema 15; length of molar series 33; greatest breadth of $m.^1$ 5·4.

*Type*. Specimen *a* above. B.M. No. 0.2.1.41.

This distinct species may be readily differentiated from the Kilima-njaro *P. valida* by its paler and more mottled colour, greyish head, white dorsal spot, the white inner sides of the limbs, and different general colour. The two East African species described by Dr. Matschie, *P. stuhlmanni* and *P. scheelei*, both have wholly white bellies.

Just as the present collection was being examined the second specimen above mentioned (*b*) arrived from that generous contributor to our National Museum, Mr. Richard Crawshay, and I have therefore dedicated the species to him, Mr. Mackinder having already a member of the genus named in his honour.

14. Nesotragus moschatus v. Düb.

*a*. Near Niana Hill, Ndoro district, Aug. 14, 1899.

*b*. In forest at foot of Mt. Kenya, 27/8/99.

The mammals obtained by Mr. Mackinder's party at Nairobi are as follows:—

1. Cercopithecus albigularis Sykes.

*a*, *b*. ♀. Nairobi Forest, 14/7/99.

2. Funisciurus jacksoni de Wint.

*a*–*e*. ♀. Nairobi Forest, 5600 ft., 14–20/7/99.

3. Mus hildebrandti Peters.

*a*. ♀. Nairobi, 6000 ft., 12/7/99.

This Mouse is determined on the authority of Mr. de Winton, by whom the above name has been placed on Mr. Jackson's examples of it from Ravine Station.

4. Arvicanthis abyssinicus Rüpp.

*a*. ♂. Nairobi, 16 July, 1899.

This specimen appears to be conspecific with Uganda specimens of *Arvicanthis* determined by Mr. de Winton as *A. abyssinicus*.

5. Tachyoryctes splendens ibeanus, subsp. n.

*a*. ♂. Nairobi Forest, 20 July, 1899.

Similar in all essential respects to the typical Abyssinian form, but rather larger, and on the average rather darker in colour, especially on the head.

For some years I have known that my reference of the East African *Tachyoryctes* to *T. splendens* was very doubtful, and have now taken the opportunity to investigate the question with such further material as has come in up to the present time.

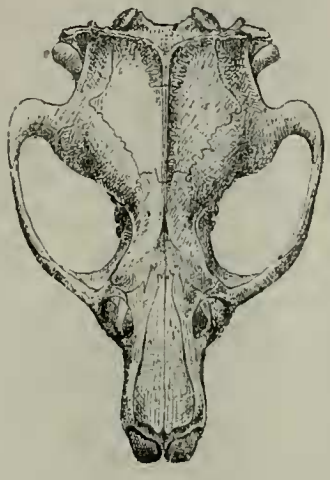
On laying out the Museum series of skulls, 9 from East Africa and 5 from Abyssinia (including one of Rüppell's co-types), it is at once evident that the former is a larger and more powerful animal, but is in other respects very closely allied. Even as to its greater size, although there is no doubt of the fact, there is some difficulty in reducing it to measurement owing to the way these animals go on increasing in size until a late period of life, so that old specimens of the small form may overtop in most measurements the nearly adult specimen of the larger. But taking only old specimens, two of each form, with sagittal crests completely developed, the following comparative measurements may be given:—

| | Basilar length. | Greatest breadth. | Diastema. |
|---|---|---|---|
| *T. s. typicus* . . . . | 37·5, 37·2 | 28, 30·5 | 16·7, 16·2 |
| *T. s. ibeanus* . . . . . | 43, 41·5 | 34, 32·5 | 18·3, 19 |

In all adult skulls also a diagonal measurement across the brain-case from the squamosal edge above the meatus of one side to the most bulging antero-lateral corner of the brain-case on the other will illustrate the difference between the two forms, this

measurement being at most 18·5 mm. in *typicus* (old), and at least 19·0 in *ibeanus*, ranging up to 20 and more.

I propose to select as a type, skin and skull No. 98.1.5.9 from Machako's, British East Africa, collected and presented by Dr. S. L. Hinde. The skull-measurements are those first given above.



Skull of *Tachyoryctes splendens ibeanus*.

External measurements of Mr. Mackinder's specimen, measured in the flesh :—Head and body 188 mm. ; tail 57 ; hind foot 29 ; ear 10.

A skull of *T. s. ibeanus* in the Museum collection, obtained by Capt. Speke, dates from 1863. Since then specimens have been received from Kilima-njaro (*Hunter & Baxter*), Bukoba (*Emin*), Machako's (*Hinde*), Mumias, Kavirondo (*Ansorge*), and now the present specimens from Nairobi.